

## PATENT COOPERATION TREATY

## PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference <b>JL3618</b>	<b>FOR FURTHER ACTION</b> see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, Item 5 below.	
International application No. <b>PCT/GB 03/ 00971</b>	International filing date (day/month/year) <b>07/03/2003</b>	(Earliest) Priority Date (day/month/year) <b>16/03/2002</b>
Applicant  <b>QINETIC LIMITED</b>		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 4 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

## 1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing:

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of invention is lacking** (see Box II).

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☐ the text is approved as submitted by the applicant.

☒ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.

☒ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

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☐ None of the figures.

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/GB 03/00971

## Box III TEXT OF THE ABSTRACT (Continuation of item 5 of the first sheet)

A phased array antenna that employs a switched least means squared architecture comprises plurality of receiving elements (502a-n) each having a respective weighting unit (504a-n) associated therewith, a summation unit (510), a processor (515), a plurality of sampling devices (516a-n) and a switching unit (527). The switching unit (527) contains a switch arm (529) having a contact at its free end, an ADC (533) and a plurality of switch contacts (535a-n) corresponding to the ends of channels (525a-n) connected to the respective sampling devices (516a-n). Each of a plurality of receiving elements (502a-n) is amplified by a respective sampling device (516a-n) prior to an incoming signal being subjected to complex weighting by respective weighting units (504a-n). Each of the signals sampled by the sampling device (516a-n) passes along respective channels (525a-n) to the switching unit (527). Thus, by switching between the contacts (535a-n) it is possible to vary which of the receiving elements is sampled. The processor (515) calculates new complex weighting coefficients to be applied to the incoming signals by the weighting units (504a-n) using the sampled incoming signals in order to minimise a difference between an output from the summation unit  $y(n)$  and a training signal  $d(n)$ .

# INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 03/00971

**A. CLASSIFICATION OF SUBJECT MATTER**

IPC 7 H01Q3/26 H04B7/08

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H01Q H04B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, INSPEC, COMPENDEX, PAJ

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB 2 188 782 A (STC PLC) 7 October 1987 (1987-10-07)	19,20
Y	the whole document	1-18, 21-25
Y	SCOTT I ET AL: "A sparse approach in partially adaptive linearly constrained arrays" ACOUSTICS, SPEECH, AND SIGNAL PROCESSING, 1994. ICASSP-94., 1994 IEEE INTERNATIONAL CONFERENCE ON ADELAIDE, SA, AUSTRALIA 19-22 APRIL 1994, NEW YORK, NY, USA, IEEE, 19 April 1994 (1994-04-19), pages IV-541-IV-544, XP010134087 ISBN: 0-7803-1775-0 the whole document	1-18, 21-25

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

**\* Special categories of cited documents:**

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
- \*E\* earlier document but published on or after the international filing date
- \*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the international filing date but later than the priority date claimed

\*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

\*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

\*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

\*Z\* document member of the same patent family

Date of the actual completion of the international search

28 May 2003

Date of mailing of the international search report

06/06/2003

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# INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 03/00971

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>GODARA L C: "APPLICATION OF ANTENNA ARRAYS TO MOBILE COMMUNICATIONS, PART II: BEAM-FORMING AND DIRECTION-OF-ARRIVAL CONSIDERATIONS"</p> <p>PROCEEDINGS OF THE IEEE, IEEE. NEW YORK, US,</p> <p>vol. 85, no. 8,</p> <p>1 August 1997 (1997-08-01), pages 1195-1245, XP000737451</p> <p>ISSN: 0018-9219</p> <p>page 1213 -page 1218</p> <p style="text-align: center;">---</p>	1-25
A	<p>BELL K ET AL: "Adaptive nulling for multiple desired signals based on signal waveform estimation"</p> <p>MILITARY COMMUNICATIONS CONFERENCE, 1992. MILCOM '92, CONFERENCE RECORD. COMMUNICATIONS - FUSING COMMAND, CONTROL AND INTELLIGENCE., IEEE SAN DIEGO, CA, USA 11-14 OCT. 1992, NEW YORK, NY, USA, IEEE, US,</p> <p>11 October 1992 (1992-10-11), pages 919-923, XP010060836</p> <p>ISBN: 0-7803-0585-X</p> <p>paragraph '000I!</p> <p>abstract</p> <p style="text-align: center;">-----</p>	1-25

### Information on patent family members

PCT/GB 03/00971

Form PCT/ISA/210 (patent family annex) (July 1992)